International Journal of Preventive Medicine

Original Article Open Access

Inequality in Utilization of In-patients Health Services in Iran

Koorosh Etemad, Parvin Yavari[1,2], Yadollah Mehrabi[3], Aliakbar Haghdoost[4], Mohammad Esmaeel Motlagh[5,6], Mohammad Javad Kabir[7], Nahid Jafari[8]

Department of Epidemiology, Faculty of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran, [1]Department of Health and Community Medicine, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran, [2]Genomic Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran, [3]Department of Epidemiology, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran, [4]Research Center for Modeling in Health, Institute of Futures Studies in Health, Kerman University of Medical Sciences, Tehran, Iran, [5]Department of Pediatrics, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, [6]Bureau of Family Health, Ministry of Health and Medical Education, Tehran, Iran, [7]Health Services Management, Health Management and Social Development Research Center, Golestan University of Medical Sciences, School of Management and Medical Information Sciences, Tehran University of Medical Sciences, Tehran, Iran, [8]Health Management and Social Development Research Center, Social Medicine Group, Faculty of Medicine, Golestan University of Medical Sciences, Gorgan, Iran

Correspondence to:
Prof. Parvin Yavari, Department of Health and Community Medicine, Faculty of Medicine, Shahid Behesht University of Medical Sciences, Velenjak, Tehran, Iran. E-mail: p.yavari-grc@sbmu.ac.ir

How to cite this article: Etemad K, Yavari P, Mehrabi Y, Haghdoost A, Motlagh ME, Kabir MJ, *et al*. Inequality in utilization of in-patients health services in Iran. Int J Prev Med 2015;6:45.

ABSTRACT

Background: Health services for those in need. Inpatient care shows a more serious side of individual care and patients and their family members perceive a high level of stress and urge. We conducted this study to determine inequalities of in-patient health care utilization in Iranian people and to assess factors that influence utilization.

Methods: In each province, the sample was comprised of 380 urban and 380 rural households that were recruited by a systematic random sampling method. A total of 23,560 households, which included around 102,000 individuals were recruited. We used the questionnaire for data collection. Met admission need (MAN) was the main variable and was considered household assets for determining the economic status. We did all analyses using the STATA version 9.1.

Results: The rates of MAN for urban and rural areas were 83% and 81.3% respectively. The rate of MAN was significantly higher in patients with higher educational level. Patients with primary health insurance coverage had significantly higher rate of MAN.

Conclusions: Meeting admission needs was estimated around 84% and it seems that modifying insurance coverage is the most feasible intervention for increasing utilization of health services.

Keywords: Inequality, inpatients, met admission need, utilization

INTRODUCTION

Equal access to essential health care can be considered as a right for human beings and one of the important issues of health equity is equal access to health services for those in need. This subject is increasingly mentioned in the researchers from all over the world.[1] Technically, measuring inequality is more feasible for researchers than measuring inequity and if they found the rationale for unjust and avoidable distribution, it can be labeled as inequity. To assess inequalities in health systems, we need to identify how the health problems such as risks or outcomes or health care utilization are distributed within subgroups or individuals of a population.[2]

There are lots of evidence and facts, which shows the presence of unjust and avoidable inequalities between

Access this article online	
Quick Response Code:	Website: www.ijpvmjournal.net / www.ijpm.ir
	DOI: 10.4103/2008-7802.158169

and within countries. Commission of social determinants of health provided clear examples of such inequalities based on social and economic determinants. Poverty, inappropriate housing, social exclusion and inefficient health systems were considered as the most important factors that influence health of the population.[3]

There are different studies in Iran that have paid attention to inequalities in health outcomes such as life expectancy or mortality during infancy or maternity or disease incidence[4-6] health risks,[7] use of protective or preventive measures such as helmet[8] and health care utilization such as access to trained healthcare worker for delivery.[9] In a study done by Olyaeemanesh *et al*. reviewed the Iranian studies in this field.[10] Other aspects of health equity such as fairness in financial contribution of people in health costs and catastrophic health expenditures have been mentioned by other researchers.[11,12] About 2.5% of the Iranian patients were exposed to catastrophic health expenditure, which was even more considerable among rural households and those without health insurance coverage.[11]

In-patient care shows a more serious side of individual care and patients and their family members perceive a high level of stress and urge. It is also one of the main sources of catastrophic health expenditures. Deprivation from inpatient care can be accompanied with dangerous and irreversible events. Availability and access to these services are not equal in different geographical areas and socio-economic strata; for instance, Tofighi *et al*. in their study have reported unequal distributions of intensive care beds in different provinces of Iran. They reported that Tehran province (capital of Iran) possessed the highest proportion of ICU beds in relation to the total number of citizens.[13] This can be evaluated through the point of view of people by population-based utilization studies; two rounds of utilization studies were carried out in Iran in 2002 and 2007 by the ministry of health and medical education (MOHME). Although the official reports described health care utilization in different subgroups of the population, there is not a further analysis to explore inequality in utilization of health services. We conducted this study to determine inequalities of in-patient health care utilization in Iranian people and to assess factors that influence utilization.

METHODS

The study was a secondary analysis of data extracted by the survey of health care utilization in Iranian population in 2007; report of the survey has not been published yet. We explain both a summary of methods of the original survey and specifications of the current study.

Study subjects

The National Health Care Utilization Survey was performed in 2007 in Iranian rural and urban households by MOHME. The national survey used provinces and urban/rural areas as the strata at the first step. In each province, the sample was comprised of 380 urban and 380 rural households that were recruited by a systematic random sampling method. In each household, everybody was recruited in the study. Tehran province was an exemption; this province was divided in two parts; the capital city of Tehran was treated separately and the rest of districts of Tehran province were sampled separately. Approximately 23,560 households, which included around 102,000 individuals were recruited. Among them, those who had a need for inpatient services (8827 subjects) were included in this study.

Study variables

In the national survey, a structured questionnaire was designed. A process of validation and pilot testing was performed before using in the survey. The questionnaire included questions with regard to demographic characteristics, socio-economic positions, insurance coverage, need for inpatient and outpatient health services, utilization of inpatient and outpatient health services and expenses related to health services. In our study, we extracted and analyzed those data from the national survey related to need for healthcare hospitalization services, utilization from these services, probable factors that might be related to meet needs for highlight services. We defined a binomial variable named as met admission need (MAN) which determines whether a need for inpatient services had been met or not.

Data collection process

Data was collected by experienced and trained interviewers. Ten data collection teams consisted of a man and a woman were selected as interviewers in each province. Interviewers were trained for data collection during special educational workshops. An expert supervisor was selected to control the process of data collection in each province. Interviewers completed questionnaires based on interviews with the head of the households and then each family member. Parents responded to questions on behalf of children under 15 years old.

The national survey had a protocol of quality control; about 5% of completed questionnaires were re-checked to ensure the accuracy of data.

Data analysis

MAN was the main variable in this study. Each individual referred to a hospital or recommended for hospital admission by an authorized person, was

considered a case of MAN when she/he eventually admitted in a hospital or dismissed by the hospital physician because of no need for admission. Proportions and 95% confidence intervals (95% CI) of MAN in different subgroups were estimated using the Bootstrap method by 500 replications. Subjects were weighted based on the share of the province (or Tehran city) in the sample of original national survey and real share of the province in population of the country.

We considered household assets for determining the economic status and constructed an asset index as a surrogate variable for economic status. The following assets were considered: number of rooms in the house per person, having at least one of each mentioned assets for use of household members (not-shared with other households): Kitchen in the house, bath, toilet, freezer, flat screen TV, mobile, washing machine, dishwasher, microwave oven, vacuum cleaner, personal computer, car and home access to internet; having more than one car for the household members, personal house and personal villa were considered as other assets. Using the principle component analysis method, we calculated a quantitative proxy for economic status of each household. This proxy was the sum individual assets, weighted by the elements of the first eigenvector and neither rotation.[14]

We did this analysis on all households. The subjects were ranked based on their proxy value of their households and classified in five quintiles from the poorest (1st quintile) to the richest (5th quintile).

Logistic regression analysis was performed to assess the relationship between MAN as a dependent variable and probable related factors. Odds ratios (OR) and 95% CI were computed.

We did all analyses using the STATA version 9.1. (Stata Corporation, College station, TX).

RESULTS

A total of 8827 individuals had been referred to hospitals or therapeutic centers for admission during 12 months before interview time and 7409 (83.9%; 95% CI: 83.3-84.6%) cases were classified as those with a MAN. The remaining 1418 patients (16.1%) had an unmet admission need.

The rates of MAN for urban and rural areas were 83.0% (95% CI: 81.4-84.7%) and 81.3% (79.6-83.0%), respectively.

Figure 1a shows the rates of MAN in different provinces of Iran. The maximum and minimum rates of MAN were 94.2% and 73.0% in Yazd and West-Azerbaijan provinces, respectively. The rate of MAN was relatively similar in men (83.4%; 95% CI: 82.3-84.6%) and women (84.4%; 95% CI: 83.4-85.3%). Table 1 summarizes data concerning the MAN in patients over 15 years old based on marital status. The rates of MAN in different educational levels in patients over 18 years are shown in Table 2. Among patients over 18 years olds individuals with educational level of primary school and illiterates had the lowest MAN and the rate of MAN was significantly higher in patients with higher educational level ($P = 0.0008$). Regarding occupation, the highest and lowest rate of MAN belonged to unemployed individuals with income (including those with unearned income or retired people) and jobless individuals seeking a job, respectively [Table 3] ($P = 0.0001$).

Patients with primary health insurance coverage had significantly higher rate of MAN (83.4%; 95% CI: 82.6-85.1) than those without primary insurance (75.8%; 95% CI: 72.2-79.3%). In contrast, the rate of MAN in patients covered by both primary and complementary health insurance (88.3%; 95% CI: 85.2-91.4%) was significantly higher than those covered only by primary insurance.

Table 4 shows the rate of MAN in different quintiles of economic status. The lowest MAN rate was seen in the first quintile and we found a significant increasing trend for MAN pro-higher quintiles of economic status ($P = 0.0075$). We used logistic regression analysis to assess the relationship between MAN as the dependent variable and different co-variances (including quintiles of economic status, age groups, gender, education, primary insurance coverage, complementary insurance coverage and urban/rural residency). Adjusted OR of the above mentioned relationships are shown in Table 5. There was an obvious gradient for estimates of OR by moving from the richest to highest group. Furthermore, the highest MAN was seen in infants and all other age groups had lower OR. Not-having insurance coverage (both primary and complementary) and being single (vs. married) were among the significant predictors. Residence in urban or rural area was not an independent predictor of MAN.

Figure 1b shows the cumulative percentage of MAN according to cumulative percentage of people ranked from lowest to highest economic status (Concentration curve). Although there was a fair overlap with line of equality, the rate of MAN was statistically higher in individuals with higher economic status; the concentration index (standard error) was 0.0174 (0.0043).

DISCUSSION

We assessed in-patient health care utilization in Iran and some of its related factors. In our study, the need for admission was not met for approximately 16% of the

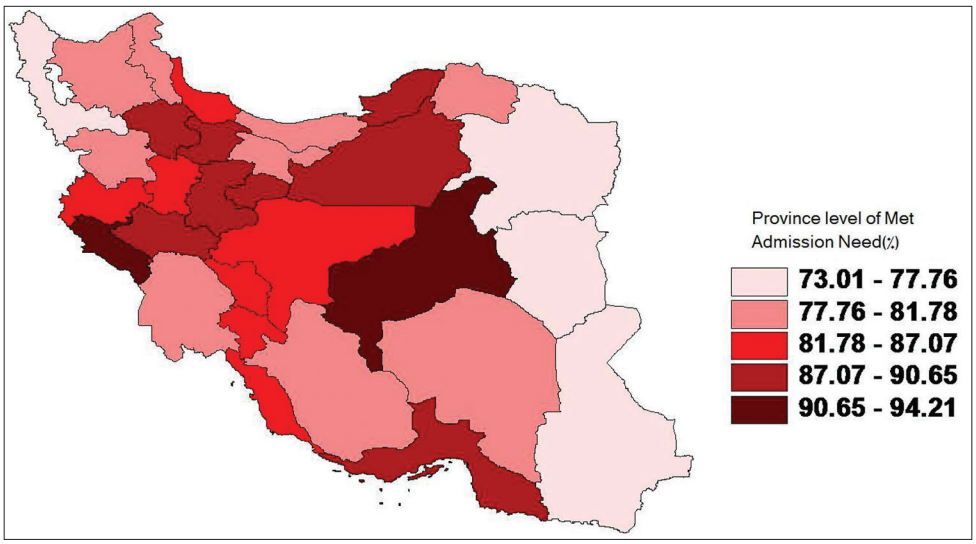

Figure 1a: The rate of met admission needs in different provinces in Iran

Table 1: Distribution of the MANs in patients over 15 years-old based on marital status

Marital status	N	MAN %	95% CI	
Married	5682	84.0	83.1	85.0
Divorced/widow	679	85.3	82.6	87.9
Single	1053	82.1	79.8	84.5

MAN=Met admission need, CI=Confidence interval

Table 2: Distribution of the MANs in different educational levels (>18 years)

Educational level	N	MAN %	95% CI	
Illiterate	2561	82.0	80.5	83.5
Incomplete primary school	984	81.7	79.4	84.0
Primary school	1321	83.8	81.8	85.8
Secondary school	823	84.3	81.9	86.7
High school/diploma	922	89.4	87.4	91.4
University	498	89.8	87.1	92.4

MAN=Met admission need, CI=Confidence interval

Table 3: Distribution of the rate of MANs in a different occupation groups

Occupation	N	MAN %	95% CI	
Employed		80.9	78.4	83.5
Jobless with unearned income or pension		87.5	83.9	91.2
Housewife		84.3	82.7	86.0
Student		76.6	71.9	81.3
Jobless seeking for job		72.3	62.4	82.2
Jobless not-seeking for job		78.9	74.6	83.3

MAN=Met admission need, CI=Confidence interval

Table 4: Distribution of the rate of MANs based on the quintiles of SES

Quintiles of SES	MAN %	SE	95% CI	
1st quintile	78.76	1.54	75.73	81.78
2nd quintile	80.16	1.58	77.06	83.27
3rd quintile	83.12	1.39	80.39	85.84
4th quintile	82.22	1.52	79.25	85.19
5th quintile	85.74	1.24	83.32	88.17

MAN=Met admission need, CI=Confidence interval, SE=Standard error, SES=Socio-economic status

participants. We found relationships between MAN and some demographic (age), socio-economic (education level and economic status), geographical (province of residence) factors and health insurance coverage. We did not find a significant difference between subgroups of gender and residency location (urban or rural) with regards to the MAN.

No significant difference was seen between urban and rural rates of MAN. Similarly Henderson *et al*. in their study have reported no significant difference in health care utilization between rural and urban cases.[15]

The rate of MAN was similar in males and females. The results of a study from China were in line with our study.[16] In another study from China, however, utilization of health care services was significantly higher in females than males.[15] Different health care needs in males and females may lead to differences in health-seeking behavior and consequently different levels of access to health care. Nonetheless, among individuals with similar needs for healthcare, difference in utilization rate will result in inequality and injustice.

Single participants had lower rates of MAN than married or divorced patients. Joung *et al*. similarly, reported lower

Table 5: Logistic regression analysis for assessing socioeconomic and demographic factors that predict MAN

Covariates	Adjusted OR (95% CI)	P value
Economical quintiles		
Richest	1.00 (-)	-
4th	0.86 (070-1.06)	0.165
3rd	0.77 (0.62-0.96)	0.018
2nd	0.77 (0.62-0.96)	0.019
Poorest	0.61 (0.49-0.76)	0.000
Age group (year)		
<1	1.00 (-)	-
1-4	0.69 (0.32-1.52)	0.360
5-14	0.36 (0.17-0.75)	0.007
15-24	0.43 (0.21-0.89)	0.023
25-39	0.35 (0.17-0.74)	0.006
40-59	0.25 (0.12-0.53)	0.000
60-74	0.45 (0.21-0.95)	0.036
75 or more	0.60 (0.28-1.31)	0.200
Gender		
Male	1.00 (-)	-
Female	1.10 (0.96-1.25)	0.183
Marital status		
Married	1.00 (-)	
Divorced, widow	0.97 (0.75-1.24)	0.124
Single	0.72 (0.57-0.90)	0.083
Education		
Years of schooling	1.03 (1.01-1.05)	0.001
Primary insurance		
Having	1.00 (-)	-
Not having	0.58 (0.48-0.69)	0.000
Complementary insurance		
Having	1.00 (-)	-
Not having	0.71 (0.55-0.93)	0.014
Residency		
Urban	1.00 (-)	-
Rural	0.99 (0.86-1.14)	0.072

MAN=Met admission need, CI=Confidence interval, OR=Odds ratio

hospitalization and healthcare utilization rates among patients who were never married.[17] These differences may be due to socio-psychological or life-style factors. Further studies are needed to assess this relationship.

The rate of MAN was significantly higher in more educated patients. This result is in agreement with some other studies.[15,18] Individuals with higher education levels show better health care seeking behavior and their health care access and utilization is usually better than less educated persons. Thus, special attention should be given to patients with lower education levels.

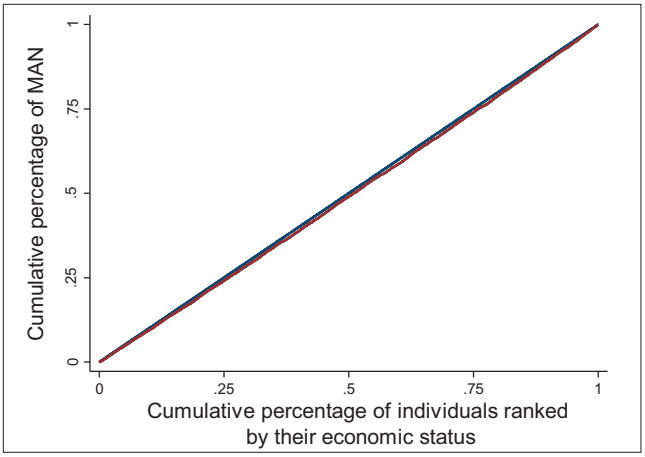

Figure 1b: The cumulative percent of met admission needs according to economical groups (lowest to highest)

We found a significant relationship between occupation and MAN, which is in line with previous reports.[15]

The rate of MAN was significantly higher in patients covered by both primary and complementary health insurance. Yip and Berman have reported better access to healthcare for individuals with health insurance coverage.[19] The results of another study from China also suggested improved health care utilization after a health insurance reform program.[20] Health insurance coverage has been known as an important indicator for health care utilization.

The rate of MAN was significantly more in higher economical quintiles. In other words, patients with better economic status had better access to healthcare services. Morris *et al.* also showed a significant relationship between use of secondary care and income.[21] Economic status is an important indicator for access to health services and is one of the major sources of inequality in healthcare utilization.

Disparities between the provinces were compatible with some other studies reported geographical disparities.[22,23] The differences are partly due to inter-provincial differences in important factors such as age, sex ratio, years of schooling and economic status, however it needs to be probed more extensively.

We did not find a noticeable difference between MAN in rural and urban residents. There are some evidence regarding the decreasing trend of urban-rural areas in some important health outcomes in the recent decades.[24] Higher penetration of primary health care services in a rural area and clearer referral system might compensate the problem of physical access in rural areas.

In this study, we did not have enough data to assess other probable sources of health inequalities such as

ethnicity or religion. Furthermore, we did not assessed disparities between different cities among the provinces.

In general, patients have different health needs and differences in healthcare utilization are acceptable and logical if they are only due to differences in patients' needs. But inequalities in access to health care are not ethically acceptable if these inequalities are a result of socio-demographic factors including gender, occupation, ethnicity,[15,25] education, or supplemental educational services. Therefore, health policy makers should consider these inequalities in decision making, especially when resource allocation is concerned.

Among the factors related to unequal access to inpatient services in this study, increasing of the insurance health coverage seems to be the most feasible approach. In the new strategy of family physician program for rural and urban areas of Iran, an ambitious universal access to health insurance has been planned;[26] optimistically, this plan would help to increase MAN for inpatient services. Although interventions such as reducing poverty and increasing years of schooling are fundamental, their modification will not be easy in the near future.

CONCLUSIONS

Meeting admission needs was estimated around 84% in this study and there is considerable opportunity for improvement. It seems that modifying insurance coverage is the most feasible intervention for increasing utilization of health services.

ACKNOWLEDGEMENTS

This article has been extracted from PhD thesis in Epidemiology at Shahid Beheshti University of Medical Sciences. We appreciate deputy of health in ministry of health and education which conducted this survey.

Received: 07 Jan 14 **Accepted:** 07 Jan 15
Published: 04 Jun 15

REFERENCES

1. Hendryx MS, Ahern MM, Lovrich NP, McCurdy AH. Access to health care and community social capital. Health Serv Res 2002;37:87-103.
2. Farshad AA. Equity in health. Iran Occup Health 2009;6:1-5.
3. Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. Geneva: World Health Organization; 2008.
4. Hosseinpoor AR, Mohammad K, Majdzadeh R, Naghavi M, Abolhassani F, Sousa A, *et al.* Socioeconomic inequality in infant mortality in Iran and across its provinces. Bull World Health Organ 2005;83:837-44.
5. Tajik P, Nedjat S, Afshar NE, Changizi N, Yazdizadeh B, Azemikhah A, *et al.* Inequality in maternal mortality in iran: An ecologic study. Int J Prev Med 2012;3:116-21.
6. Rohani-Rasaf M, Moradi-Lakeh M, Ramezani R, Asadi-Lari M. Measuring socioeconomic disparities in cancer incidence in Tehran, 2008. Asian Pac J Cancer Prev 2012;13:2955-60.
7. Hosseinpoor AR, Bergen N, Kunst A, Harper S, Guthold R, Rekve D, *et al.* Socioeconomic inequalities in risk factors for non communicable diseases in low-income and middle-income countries: Results from the World Health Survey. BMC Public Health 2012;12:912.
8. Sehat M, Naieni KH, Asadi-Lari M, Foroushani AR, Malek-Afzali H. Socioeconomic Status and Incidence of Traffic Accidents in Metropolitan Tehran: A Population-based Study. Int J Prev Med 2012;3:181-90.
9. Moradi-Lakeh M, Ramezani M, Naghavi M. Equality in safe delivery and its determinants in Iran. Arch Iran Med 2007;10:446-51.
10. OlyaeeManesh A, Haghdoost AA, Beheshtian M, Tehrani-Banihashemi A, Motlagh M. Progress towards health equity in I.R. of Iran through last three decades. Iran J Publ Health 2009;38:130-5.
11. Mehrara M, Fazaeli A. Health finance equity in Iran: An analysis of household survey data (1382-1386). J Health Adm 2010;13:51-62.
12. Kavosi Z, Rashidian A, Pourreza A, Majdzadeh R, Pourmalek F, Hosseinpour AR, *et al.* Inequality in household catastrophic health care expenditure in a low-income society of Iran. Health Policy Plan 2012;27:613-23.
13. Tofighi S, Meskarpour AM, Ameriuon A, Naseri H. Equity in distribution of intensive care beds in Iran with gini coefficient and lorenz curve approach. YAFT-E 2010;2:75-83.
14. The World Bank. Quantitative Techniques for Health Equity Analysis-Technical Note #13, Measuring inequity in health service delivery. http://www.siteresources.worldbank.org/INTPAH/Resources/Publications/Quantitative-Techniques/health_eq_tn13.pdf. [Last accessed on 2012 Nov 3].
15. Henderson G, Akin J, Zhiming L, Jin S, Ma H, Ge K. Equity and the utilization of health services: Report of an eight-province survey in China. Soc Sci Med 1994;39:687-99.
16. Henderson GE, Akin JS, Hutchinson PM, Jin SG, Wang JM, Dietrich J, *et al.* Trends in health services utilization in eight provinces in China, 1989-1993. Soc Sci Med 1998;47:1957-71.
17. Joung IM, van der Meer JB, Mackenbach JP. Marital status and health care utilization. Int J Epidemiol 1995;24:569-75.
18. Alguwaihes A, Shah BR. Educational attainment is associated with health care utilization and self-care behavior by individuals with diabetes. Age 2009;65:30.
19. Yip W, Berman P. Targeted health insurance in a low income country and its impact on access and equity in access: Egypt's school health insurance. Health Econ 2001;10:207-20.
20. Liu GG, Zhao Z, Cai R, Yamada T, Yamada T. Equity in health care access to: Assessing the urban health insurance reform in China. Soc Sci Med 2002;55:1779-94.
21. Morris S, Sutton M, Gravelle H. Inequity and inequality in the use of health care in England: An empirical investigation. Soc Sci Med 2005;60:1251-66.
22. Movahedi M, Hajarizadeh B, Rahimi A, Arshinchi M, Amirhosseini K, Haghdoost AA. Trends and geographical inequalities of the main health indicators for rural Iran. Health Policy Plan 2009;24:229-37.
23. Moradi-Lakeh M, Bijari B, OlyaeeManesh A, Khosravi A. Trends of alterations in disparities of mortality in rural areas of different provinces (Iran, 1993-2008). SJKU 2010;15:49-58.
24. World Health Organization. The world health report 2008: Primary health care, now more than ever. Geneva, World Health Organization; 2008.
25. Mayberry RM, Mili F, Ofili E. Racial and ethnic differences in access to medical care. Med Care Res Rev 2000;57:108-45.
26. Khayyati F, Motlagh ME, Kabir M, Kazemeini H, Gharibi F, Jafari N. The role of family physician in case finding, referral, and insurance coverage in the rural areas. Iran J Public Health 2011;40:136-9.

Source of Support: Nil, **Conflict of Interest:** None declared.